DOCUMENT RESUME

ED 039 157 SO 000 011

AUTHOR	Geyer, James R.
TITLE	Cloze Procedure as a Predictor of Comprehension in Secondary Social Studies Materials.
INSTITUTION	Washington State Board for Community Coll. Education, Olympia.
PUB DATE	68
NOTE	10p.
EDRS PRICE	EDRS Price MF-$0.25 HC-$0.60
DESCRIPTORS	*Cloze Procedure, Instructional Materials, Measurement Instruments, Predictive Ability (Testing), *Predictive Measurement, *Readability, *Reading Comprehension, Research Reviews (Publications), Secondary School Students, *Social Studies
IDENTIFIERS	*Dale Chall Readability Formula

ABSTRACT

The major problem investigated was the effectiveness of cloze procedure as a predictor of a student's ability to comprehend social studies materials when compared with I.Q. scores, previous social studies grades, and standardized reading test scores. As a secondary purpose, the effectiveness of rewritten social studies materials as a means of improving comprehension was studied. As a preliminary, various readibility measures formulas were reviewed. Those included were: Lively and Pressey, Gray and Leary, Lorge, Flesch, Dale-Chall. Research on the application and effect on comprehension of these formulas was also reviewed. Students completed a pre-reading cloze test from one of two texts utilized. They then read the chapter from which the cloze test had been constructed, and completed a fifty item multiple-choice test. The cloze procedure was found not to be better than the other variables in predicting comprehension levels at the .01 significance level. However, it was significant at the .05 level. To fulfill the secondary purpose, two identical texts were used, however, the readability levels were different (grade 5-6, grade 7-8). A multiple-choice test was constructed to measure knowledge acquired after reading. It was found that reducing vocabulary difficulty and sentence complexity may not significantly improve comprehension scores. (SBE)

ED039157

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

N-X

CLOZE PROCEDURE AS A PREDICTOR OF COMPREHENSION IN SECONDARY SOCIAL STUDIES MATERIALS

INTRODUCTION

The investigation upon which this presentation is based involved the following problems:

1. The major problem investigated how predictive of a student's ability to comprehend social studies materials are cloze procedure scores when compared with I.Q. scores, previous social studies grades, and standardized reading test scores.
2. The secondary investigation dealt with the problem, does rewritten social studies materials on an easier readability level improve the comprehension of that material?

Development of Readability Measures

Interest in assessing printed materials has existed for some time. Lorge[1] indicates that the Talmudists in A.D. 900 counted words in a usual or unusual sense. One of the first scientifically oriented attempts to quantify a readability factor occurred in 1889 when F. W. Kaeding attempted to ascertain the frequency of occurrence of 11,000,000 words. The importance of the above study along with Thorndike's investigation[2] or word frequency is suggested by the initial inclusion of vocabulary factors alone in the Lively and Pressey readability formula.[3] This formula is credited by Chall[4] as being the first quantitative study of readability.

SO 000 011

By 1928 the emphasis on vocabulary factors as the basis of predicting readability was recognized as being inadequate. During the second period of readability exploration, extending through 1939, investigators of readability searched for factors other than vocabulary which would provide more accuracy in prediction. Representative of this period is the work of Gray and Leary.[5] In studying previous findings in readability and securing the opinions of about 100 experts and 170 library patrons, Gray and Leary found 389 factors which were assigned to the categories of content, style of expression and presentation, format, and general features of organization.

Difficulties in evaluating qualitative factors and the interrelatedness of many of the variables investigated by Gray and Leary were instrumental on ushering in the next period of readability investigation. During this period, which began about 1939 with the appearance of the Lorge Readability formula,[6] the basis for development of readability formulas rested on the premise that a small number of factors could validly predict readability. The two-factor Flesch and Dale-Chall formulas were credited by Chall[7] with giving a readability prediction comparable to the five-factor Gray and Leary formula.

Limitations of Readability Formulas

In the process of objectifying and simplifying the application of readability formulas, a measure of vocabulary and sentence factors was usually included. A source of criticism of these formulas lies in their avoidance of measuring other factors of readability.

Lorge[8] indicates that readability formulas measure four elements. They are vocabulary load, sentence structure, idea density, and human interest. He adds that no other internal elements of comprehensibility have been useful in predicting passage difficulty although the lack of a measurement of conceptual difficulties and organization of the printed material is a fundamental weakness of formulas.

Chall[9] adds reinforcement to the above statement. She suggests that readability formulas do not measure abstractness, vagueness, illogical organization, difficulty of words, conceptual difficulty, content, and physical features.

Smith and Dechant[10] support the above statements while attending to certain variables not previously mentioned. They state that readability formulas pay little attention to six factors which are determinants of readability. These factors are density and unusualness of facts, number of pictoral illustrations, interest and purpose, concept load and abstractness of words, organization of material and format, and interrelationship of ideas.

Dale and Chall[11] suggest that three variables affect readability. Included are the printed material and its stylistic elements, the criterion measure and the method used to make the readability estimate, and the reader along with the qualities he brings to the printed page.

In summary, a limitation of the readability formulas appears to be evident with consideration of the variables mentioned above by Dale and Chall as only two of these factors are quantified. Since individual capabilities and characteristics are not considered in application of readability formulas for evaluation of written materials, difficulties

may be encountered when one attempts to equate the reader and instructional material on the basis of such quantification. The discussion below expands and supports this statement.

Readability Formula Application and Effect on Comprehension

The statements above note certain limitations which are associated with quantitative evaluations of printed materials. Results of empiracal assessments of readability formula procedures are presented below.

Since one of the elements common to the most widely used readability formulas is some measurement of vocabulary, this variable would logically be included in investigations of readability assessment. Nolte[12] investigated the effects of comprehension on mechanically simplifying vocabulary terms. Pictoral tests and personal interviews were employed to measure comprehension. Nolte reported, "Many vocabulary difficulties and numerous erroneous concepts were disclosed...

Wilson's study[13] included a three-hundred word passage which was amplified into six-hundred and twelve-hundred word versions. Since students comprehended the longest and structurally most difficult version significantly better, the efficacy of simplifying sentence factors as a means of improving comprehension may be open to question.

McC racken[14] investigated the effectiveness of applying readability formula criteria in producing more readable materials. He rated the difficulty of two passages by the Yoakam and Dale-Chall formulas. By adjusting the vocabulary load, the readability levels were interchanged. Multiple-choice results based on factual comprehension led McCracken to conclude that

> Selections written to confirm with a set of vocabulary standards in order to increase or decrease their readability actually may not increase or decrease their readability as much as indicated. A selection thus written would seem to have a contrived or artificial readability level.

As a secondary purpose, the present study investigated the effectiveness of rewritten social studies materials as a means of improving comprehension. Two social studies texts were included in the study. These texts contained identical topics and visual aids such as pictures and maps, however, the readability levels were different as determined by application of the Dale-Chall Readability formula. The easier text was rated at a fifth-sixth grade level in readability while the more difficult text was placed at the seventh-eighth grade level. A single, multiple-choice test was constructed to measure knowledge acquired afyer reading a randomly selected chapter. Analysis of covariance was applied to factor out the effects of reading achievement levels, I.Q., and previous social studies grades. The null hypothesis of no significant differences between admusted means was not rejected.

It is not the intent of this paper to suggest that readability formulas have no validity in adjusting readability levels. However, the above findings indicate that attempting to provide more readable materials by reducing sentence and vocabulary factors may not benefit the students for whom it is intended.

The Cloze Procedure

In 1953 Wilson Taylor[15] initiated a completion system which he termed the cloze procedure. This system is defined as being a method of intercepting a message (written or spoken), mutilating it by deleting parts,

and then administering it to receivers (readers or listeners). The degree of success in restoring the missing elements is indicative of the individual's capacity and/or ability to deal with that message. This interaction between the reader and the printed material appears to circumvent certain limitations of readability formulas. Taylor[16] suggests that the cloze procedure seems to measure the effects of many elements of reading by involving the reader with the material to be read.

Validity and Reliability of the Cloze Procedure

Many studies have confirmed the validity of the cloze procedure as a measure of readability. In his initial experiment, Taylor finds that several reading passages were ranked in the same order by the Dale-Chall Readability formula, the Flesch Readability formula, and the cloze procedure. Rankin[18] reports correlations between standardized reading test scores and cloze test scores ranging from .65 to .81.

A number of studies relate reliability findings for the cloze procedure in pre- and post-test scores. Taylor[19] states that such correlations for three cloze forms employed in this investigation ranged from .80 to .88. Coleman and Miller[20] find a correlation of .93 between pre- and post-test scores. Hence, the above findings appear to confirm reliability and validity of the cloze procedure as a measure of readability.

Cloze as a Predictor of Comprehension

As a rationale for this study which investigated the effectiveness of the cloze procedure as a predictor of ability to comprehend social studies

materials, two studies appeared to be pertinent. Bormuth[21] established a frame of reference between cloze test scores and equivalent comprehension scores. Hafner[22] investigated the effectiveness of the cloze procedure as a predictor of course grades in a college methods class with a resultant correlation of .65 being reported. These data suggest that the degree of comprehensibility an individual finds in instructional material may be predicted by pre-reading cloze scores.

Procedure and Findings

Data were obtained for this study by the following procedure. Students first completed a pre-reading cloze test from one of the two texts utilized in the study. An every fifth-word deletion system was employed. After completion of the cloze test, the student read the chapter from which the cloze test had been constructed and completed a fifty-item multiple-choice test.

To test the hypothesis concerning the predicitve effectiveness of the cloze procedure as compared to the predictive effectiveness of the standardized reading test scores, I.Q. scores, and previous social studies grades as predictors of how well students comprehend social studies materials, significant differences between two correlations coefficients involving a common variable were investigated with application of a procedure described by Tate[23]. At the .01 level the cloze procedure was not found to be significantly better than other variables in predicting comprehension levels. In reference to the standardized reading test scores, the findings were in the opposite direction of the prediction. At the .05 level, however, cloze scores were found to be significantly better predictors of comprehension of the social studies material as measured in this study than I.Q. scores

and previous social studies grades.

Discussion

A difference in the opposite direction of the prediction was found im comparing the effectiveness of prediction of cloze and standardized reading test scores. This result might be attributable to the similarity of the kinds of questions, i.e., multiple-choice items in the criterion measure and the standardized reading test. Completion of the cloze test may have required a different, more subjective type of comprehension ability than did the standardized reading test.

The efficacy of rewritten social studies materials on a lower readability level as a means of improving comprehensibility of such material was investigated. Reinforcement was given to certain previous studies in that objectively reducing vocabulary difficulty and sentence complexity may not significantly improve comprehension scores.

Continued investigation of the cloze procedure as a predictor of comprehension appears to be warranted. Numerous studies indicate that the cloze procedure is a valid and reliable measure of readability. The significant differences at the .05 level in comparing the predictive effectiveness of cloze scores to I.Q. scores and previous social studies grades also support the above suggestion.

Bormuth's frame of reference was mentioned previously. The findings of this study suggest that a universal frame of reference may not be feasible.

1. Irving Lorge "Word Lists as Background for Communication," in Teacher's College Record XLV (May, 1944), p. 544.

2. E. L. Thorndike, The Teacher's Word Book, (New York, 1921).

3. Bertha Lively and Samuel Pressey "A Method for Measuring the Vocabulary Burden of Textbooks," in Educational Administration and Supervision," IX (October, 1923), pp. 92-95.

4. Jeanne S. Chall, Readability, An Appraisal of Research and Application (Columbus, 1958), p. 17.

5. W.S. Gray and B.E. Leary, What Makes a Book Readable...: An Initial Study (Chicago, 1935).

6. Irving Lorge "Predicting Readability," in Teacher's College Record XLV (March, 1944), pp. 404-19.

7. Jeanne S. Chall, Readability, An Appraisal of Research and Application (Columbus, 1958), p. 90-91.

8. Irving Lorge "Readability Formula-An Evaluation," in Elementary English XXVI (February, 1949), pp. 90-91.

9. Jeanne S. Chall, Readability, An Appraisal of Research and Application (Columbus, 1958), p. 31-32.

10. Henry P. Smith and Emerald V. Dechant, Psychology in Teaching Reading (Englewood Cliffs, 1961), p. 251.

11. Edgar Dale and Jeanne S. Chall "The Concept of Readability," in Elementary English XXVI (January, 1949), p. 23.

12. Karl F. Nolte "Simplification of Vocabulary on Comprehension in Reading," in Elementary English Review XXIV (April, 1937), pp. 119-24; 46.

13. Mary C. Wilson "The Effect of Amplifying Materials and Reading Comprehension," Journal of Experimental Education XIII (September, 1948), pp. 5--8.

14. Robert A. McCracken "An Experiment with Contrived Readability in Fifth and Sixth Grade," in Journal of Educational Research LII (March, 1959), pp. 277-78.

15. Wilson Taylor "Cloze Procedure: A New Tool for Measuring Readability," in Journalism Quarterly XXX (Fall, 1953), pp. 415-33.

16. Ibid.

17. Ibid., p. 431.

18. Earl F. Rankin "The Cloze Procedure-Its Validity and Utility," in Starting and Improving College Reading Programs. Eighth Yearbook of the National Reading Conference. (Fort Worth, 1958), p. 138.

19. Wilson Taylor "Cloze Procedure: A New Tool for Measuring Readability," in Journalism Quarterly XXX (Fall, 1953), p. 23.

20. E. B. Coleman and G.R. Miller "A Measure of Information Gained During Prose Learning," in Reading Research Quarterly III (Spring, 1968), p. 384.

21. John R. Bormuth "Comparable Cloze and Multiple-Choice Test Scores," in Journal of REading X (February, 1967), p. 295.

22. Lawrence E. Hafner "Relationships of Various Measures to the 'Cloze'," in New Concepts in College-Adult Reading. Thirteenth Yearbook of the National Reading Conference. (Milwaukee, 1964), pp. 135-45.

23. Merle W. Tate, Statistics in Education and Psychology (New York, 1965), pp. 282-83.